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Claims 1, 6 and 7-9 are presently rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,744,763 to Iwasa et al. when considered in combination with U.S. Patent 5,034,443 to Bae et al. As will be appreciated from the following comments, this rejection does not meet the appropriate standard under 35 U.S.C. § 103, is improper and should be withdrawn.

As set forth in MPEP § 2142, in order to establish a *prima facie* case of obviousness, three basic criteria must be met.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

*In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

In formulating the rejection of claim 1 based upon the combination of Iwasa et al. and Bae et al., "[t]he Examiner equates the non-woven fabric layers or outer covering layers 12 to Applicant's 'first and second structural layers' and the pulverized rubber layer 11 to Applicant's 'insulating layer'." See p. 3 of Office Action.

On page 5 at lines 15-23, the Iwasa et al. reference provides that the "... covering layers 12 in this embodiment can, for example, comprise a polyethylene terephthalate (PET) nonwoven fabric. The covering layers 12 alternatively may be a nonwoven or woven fabric, a net or a film of a synthetic resin material including polyesters such as polybutylene terephthalate (PBT), polyamides such as nylon, polyolefins such as polypropylene (PP) and polyvinyl chloride (PVC) or a natural fiber material including cotton, linen and various pulp based materials." (Emphasis added).

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It is significant to note the term "or" used in this document. In fact, the covering layers 12 in the Iwasa et al. patent are not composites: that is, they are not a combination of chopped fibers and a resin but instead are one or the other.

Significantly, claim 1 of the present application provides that ". . . at least one of said first and second structural layers is formed from a reinforced composite comprising a non-woven mat including a plurality of chopped fibers and a polymeric material wherein said polymeric material comprises a polyvinyl chloride containing a heat stabilizer . . ." Clearly, the primary reference to Iwasa et al. does not disclose structural layers formed from a composite material much less a composite material including a plurality of chopped fibers and a polymeric material comprising a polyvinyl chloride containing a heat stabilizer as explicitly set forth in claim 1 of the present application.

Further, it must be noted that there is no suggestion in the Iwasa et al. patent to lead one skilled in the art to utilize a composite material for the covering layers 12 provided in that patent. More specifically, the only function of the covering layers 12 disclosed in the Iwasa et al. patent is to form an envelope for holding the pulverized rubber grains 11 and preventing them from spilling out (see col. 5 lines 26-30). Clearly, the Iwasa et al. patent explicitly teaches materials to be used for making the covering layers 12 and composite materials are not one of them. Further, no apparent benefit would be gained by the use of composite materials. As such, not only does the Iwasa et al. patent fail to provide any teachings suggesting the use of composite materials for this purpose but it actually explicitly teaches away from the use of these materials by only listing other alternative materials. Of course, it is well established that it is error to find obviousness where references "diverge from and teach away from the invention at hand".

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See *W. L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 USPQ 303, 311 (Fed. Cir. 1983) and *In re Fine*, 5 USPQ 2d 1596, 1599 (Fed. Cir. 1988).

U.S. Patent 5,034,443 to Bae et al. fails to provide the missing teaching. More specifically, the Bae et al. patent is directed to stabilized compositions for polyvinyl chloride resins. Applicants are, however, unable to find where the Bae et al. patent refers at any point to composite materials or fiber or fibrous materials. Thus, while a combination of Iwasa et al. and Bae et al. might lead one skilled in the art to make the covering layers 12 in the Iwasa et al. patent from polyvinyl chloride with heat stabilizers as taught by Bae et al., it would not lead one skilled in the art to make those covers from a reinforced composite comprising a plurality of chopped fibers and a polyvinyl chloride polymeric material containing a heat stabilizer as set forth in present claim 1. Accordingly, the proposed combination of references fails to establish a *prima facie* case for the rejection of claim 1 and this rejection should be withdrawn.

Claims 6-9 which are rejected on the same grounds are equally allowable for the same reasons. Further, these claims contain additional limitations that further support their allowability. For example, claim 6 provides that the insulation layer comprises a non-woven fabric made from one or more of a polyolefin, polyester, polypropylene, rayon, aramid and cotton. In the rejection, the Office "equates" the pulverized rubber layer 11 to the Applicant's "insulating layer". Clearly, a pulverized rubber layer is not a polyolefin, a polyester, polypropylene, rayon, aramid or cotton as set forth in claim 6 and, accordingly, claim 6 provides an additional distinction supporting the patentability of this claim.

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Claims 1 and 5 are also rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 4,828,910 to Haussling when considered in combination with U.S. Patent 5,034,443 to Bae et al. As should be appreciated from the following comments, this rejection is also improper and should be withdrawn.

More specifically, the Haussling patent teaches a laminate comprising a porous fibrous bat interior core member 3 having two outer surfaces each of which is bonded to the fibrous, porous reinforcing mats 2 and 4. The Office equates the core 3 to the Applicant's "insulating layer" and the reinforcing mats 2 and 4 to the Applicant's "first and second structural layers".

While it is true that the Haussling patent teaches that the reinforcing mats 2 and 4 can comprise a plurality of chopped glass fibers bonded together by a thermoformable resin it is equally true that Haussling explicitly teaches that "polymeric materials softening at temperatures lower than 350°F, such as polyolefins, are not operable in this invention." See column 4 lines 33-35. On page 904 of *Hawley's Condensed Chemical Dictionary*, it is stated that polyvinyl chloride decomposes at 148°C: that is, about 298.4°F (see Exhibit A), a temperature well below the 350°F prohibition explicitly set forth by Haussling.

Summarizing, the Haussling patent fails to teach that polyvinyl chloride may be used in the mats 2 and 4. Further, polyvinyl chloride would not be utilized for the mats 2 and 4 in the Haussling patent since Haussling explicitly teaches that polymeric materials softening at temperatures lower than 350°F are not operable in this invention.

While it is true that the Bae et al. patent refers to heat stabilized polyvinyl chloride resins, there is no teaching in the Bae et al. patent to indicate that these heat

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stabilized polyvinyl chloride resins do not soften below the 350°F limitation explicitly set forth in the Haussling patent. In fact, a review of the Bae et al. patent gives reason to believe the heat stabilized compositions would not meet this requirement. For example, examples 7 and 8 degraded in the long term test when exposed to temperatures as low as 250°F. Similarly, examples 35, 37 and 38 degraded to brown at 350°F after 60 or 75 minutes. Degradation at these temperatures suggests softening and such softening would rule out the utilization of the materials disclosed in the Bae et al. patent in the layers 2 and 4 of the Haussling patent.

Stated another way, the Office's proposed combination of the Haussling and Bae et al. references is contrary to the explicit teaching of the Haussling patent that polymeric materials softening at temperatures lower than 350°F are not operable in this invention. As such, there is no valid basis upon which the Office may rely to make the proposed combination. Thus, the combination is improper and the rejection of claim 1 based upon the combination of the Haussling and Bae et al. patents should be withdrawn.

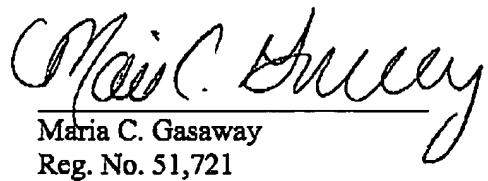
Claim 5 which depends from claim 1 and is rejected on the same grounds is equally allowable for the same reasons.

In summary, all the pending claims patentably distinguish over the prior art of record and should be allowed. Upon careful review and consideration it is believed the Office will agree with this proposition. Accordingly, the early issuance of a formal Notice of Allowance is earnestly solicited.

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Any fees required in connection with this Response may be debited to Deposit  
Account 50-0568.

Respectfully submitted,

  
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*Hawley's*  
**Condensed Chemical  
Dictionary**  
*Fourteenth Edition*

**Revised by**  
**Richard J. Lewis, Sr.**



**JOHN WILEY & SONS, INC.**

**Exhibit A**

## POLYVINYL ALCOHOL

904

**Properties:** Colorless transparent solid; odorless. D 1.19 (15C). Insoluble in water, gasoline, oils, and fats; soluble in low molecular weight alcohols, esters, benzene, and chlorinated hydrocarbons. Resistant to weathering. Combustible.

**Derivation:** Polymerization of vinyl acetate with peroxide catalysts.

**Use:** Latex water paints; adhesives for paper, wood, glass, metals, and porcelain; intermediate for conversion to polyvinyl alcohol and acetals; sealant; shatterproof photographic bulbs; paper coating and paperboard; bookbinding; textile finishing; nonwoven fabric binder; component of lacquers, inks, and plastic wood; strengthening agent for cements.

**polyvinyl alcohol. (PVA; PVOH).**

CAS: 9002-89-5. ( $-\text{CH}_2\text{CHOH}-$ ). A water-soluble synthetic polymer made by alcoholysis of polyvinyl acetate.

**Properties:** White- to cream-colored powder. D 1.27–1.31, refr index 1.49–1.53. Properties depend on degree of polymerization and the percentage of alcoholysis, both of which are controllable in processing. Water solubility increases as molecular weight decreases; strength, elongation, tear resistance, and flexibility improve with increasing molecular weight. Tensile strength up to 22,000 psi; decomposes at 200C. PVA has high impermeability to gases, is unaffected by oils, greases, and petroleum hydrocarbons. Attacked by acids and alkalies. It forms films by evaporation from water solution. Combustible.

**Grade:** Super high viscosity (mw 250,000–300,000), high viscosity (mw 170,000–220,000), medium viscosity (mw 120,000–150,000), low viscosity (mw 25,000–35,000).

**Use:** Textile warp and yarn size, laminating adhesives, molding powders, binder for cosmetic preparations, ceramics, leather, cloth, nonwoven fabrics and paper, paper coatings, grease-proofing paper, emulsifying agent, thickener and stabilizer, photo-sensitive films, cements and mortars, intermediate for other polyvinyls, imitation sponges, printing inks (glass).

**polyvinylbenzyltrimethyl ammonium chloride.** An electrically conductive polymer.

**Use:** To increase the conductivity of papers.

**polyvinyl butyral.** See polyvinyl acetal.

**polyvinyl carbazole.** A brown thermoplastic resin obtained by the reaction of acetylene with carbazole. It softens at 150C, and has excellent dielectric properties, good heat, and chemical stability but poor mechanical strength.

**Use:** Substitute for mica in electrical equipment and as an impregnant for paper capacitors.

**polyvinyl chloride. (PVC).**

CAS: 9002-86-2. ( $-\text{H}_2\text{CCHCl}-$ ). A synthetic thermoplastic polymer.

**Properties:** White powder or colorless granules. Resistant to weathering and moisture; dimensionally stable; good dielectric properties; resistant to most acids, fats, petroleum hydrocarbons, and fungus. Readily compounded into flexible and rigid forms by use of plasticizers, stabilizers, fillers, and other modifiers. Easily colored and processed by blow molding, extrusion, calendering, fluid-bed coating, etc. Available as film, sheet, fiber, and foam.

**Derivation:** Polymerization of vinyl chloride by free radicals with peroxide initiator. May be copolymerized with up to 15% of other vinyls.

**Hazard:** Decomposes at 148C, evolving toxic fumes of hydrogen chloride.

See vinyl chloride.

**Use:** Piping and conduits of all kinds; siding; gutters; window and door frames; officially approved for use in interior piping, plumbing, and other construction uses. Raincoats, toys, gaskets, garden hose, electrical insulation, shoes, magnetic tape, film and sheeting, containers for toiletries, cosmetics, household chemicals, fibers for athletic supports, sealant liners for ponds and reservoirs, adhesive and bonding agent, plastisols and organosols, tennis court surfaces, flooring, coating for paper and textiles, wire and cable protection, base for synthetic turf, phonograph records, fuel in pyrotechnic devices.

**Note:** Use of PVC in rigid and semirigid food containers such as bottles, boxes, etc., is under restriction by FDA as well as in coatings for fresh citrus fruits. Its use in thinner items such as films and package coatings is permissible. Possibility of migration of vinyl chloride monomer into food products is the critical factor; this tends to increase with the thickness of the material.

**polyvinyl chloride-acetate.**

CAS: 34149-92-3. ( $-\text{C}_2\text{H}_3\text{OOCCH}_2\text{Cl}-$ ). A vinyl chloride and vinyl acetate copolymer that is more flexible than polyvinyl chloride. The copolymer usually contains 85–97% of the chloride. It generally has similar properties and uses as polyvinyl chloride.

**polyvinyl dichloride.** (PVDC). A chlorinated polyvinyl chloride. Has high strength and superior chemical resistance over a broad temperature range. Combustible but self-extinguishing.

**Use:** Pipe and fittings for hot corrosive materials up to 100C. Immune to solvation or direct attack by inorganic reagents, aliphatic hydrocarbons, and alcohols.

**polyvinyl ether.** See polyvinyl ethyl ether; polyvinyl isobutyl ether; polyvinyl methyl ether; polyvinyl methyl ether-maleic anhydride.

**polyvinyl ethyl ether.** (PVE; polyvinyl ether). [ $-\text{CH}(\text{OC}_2\text{H}_5)\text{CH}_2-$ ].

**Properties:** Viscous gum to rubbery solid, depending on molecular weight. Colorless when pure. D 0.97 (20C), refr index 1.45 (25C). Insoluble in wa-